

## WHAT IS CLAIMED IS:

1. A method of managing a machinery monitoring system including a database of at least one rule set, the rule set including at least one rule expressed as a relational expression of a real-time data output relative to a real-time data input, the relational expression being specific to a plant asset, said method comprising:

importing data representative of a rule set into the machinery monitoring system, the data including rule set full operand relative path information;

applying the at least one rule set to a specific plant asset that is monitored by a plant monitoring and control system wherein the at least one rule set is configured to locate the data input using at least a portion of the full operand relative path information;

determining a data output of the at least one rule set using the at least one relational expression and the data input; and

transmitting the data output to at least one of the machinery monitoring system and the plant monitoring and control system.

2. A method in accordance with Claim 1 further comprising executing at least one of an event type and an actionable information text set.

3. A method in accordance with Claim 1 wherein importing data representative of a rule set comprises receiving the rule set as an Extended Mark-up Language (XML) file.

4. A method in accordance with Claim 1 wherein importing data representative of a rule set comprises receiving the rule set via at least one of an e-mail and a CD-ROM.

5. A method in accordance with Claim 1 wherein importing data representative of a rule set comprises importing the rule set into a rule set library.

6. A method in accordance with Claim 1 wherein the plant monitoring and control system is one of a plurality of plant monitoring and control systems operated by a business enterprise, said importing data representative of a rule set comprises:

creating a base rule set based on a specific plant asset type;

editing the base rule set to create a plant asset specific rule set; and

transmitting the rule set to the machinery monitoring system.

7. A method in accordance with Claim 6 wherein importing data representative of a rule set further comprises testing the plant asset specific rule set using at least one of plant asset design data, plant asset maintenance history, plant asset off-line analysis, and empirical testing.

8. A method in accordance with Claim 6 wherein editing the base rule set to create a plant asset specific rule set comprises:

selecting a condition to be detected, the condition being detectable using parameters monitored by the plant monitoring and control system;

creating a relative path to the parameters;

selecting operands to process the parameters; and

creating relative path to the output data.

9. A method in accordance with Claim 1 wherein applying the rule set to a specific plant asset comprises resolving the operands for at least one rule in the rule set.

10. A method in accordance with Claim 7 further comprising:

creating a conditionally executable at least one of an event type and an actionable information text set using the selected operands; and

appending the created at least one of an event type and an actionable information text set to the rule set.

11. A method in accordance with Claim 1 wherein the plant monitoring and control system is one of a plurality of plant monitoring and control systems operated by a business enterprise, said importing the rule set into the server system comprises:

selecting a rule set from at least one rule set applied to at least one of the plurality of plant monitoring and control systems; and

transmitting the selected rule set from the at least one of the plurality of business enterprise plant monitoring and control systems to the plant monitoring and control system.

12. A method in accordance with Claim 11 further comprising editing a rule set by the business enterprise user after the rule set is applied on the plant monitoring and control system.

13. A method of managing a modular software application including a plurality of software modules, wherein each module has a user interface that includes a plurality of configurable parameters, the parameters selectable from at least one of a menu bar selection, a right-click menu selection, a property page selection, said method comprising:

interfacing an object-oriented graphical user interface (GUI) window with the modular software environment wherein the GUI controls the execution of the plurality of software modules;

linking the configurable parameters to the GUI window such that a hierarchical tree view of the configurable parameters is output; and

extending the GUI window using a plug-in facility in the GUI window such that additional software module configuration parameters are selectably managed by the application using a selectable user interface presentation.

14. A method of managing a modular software application in accordance with Claim 13 wherein the GUI window includes a hierarchical listing structure in a tree view, said method further comprising:

listing selectable software modules that include configurable parameters in a first portion of the GUI window; and

listing configuration parameters of a software module when an associated software module is selected in a second portion of the GUI window.

15. A method of managing a modular software application in accordance with Claim 14, said method further comprising:

listing a selected configuration parameter in a first portion of the GUI window; and

listing available sub-parameters for the selected configuration parameter in a second portion of the GUI window.

16. A method of managing a modular software application in accordance with Claim 14, said method further comprising expanding and collapsing the listings in the first portion of the GUI window such that at least one child of the listed item is listed in the first portion subordinate to the listed item and such that the at least one child is listed in the second portion of the GUI window.

17. A method of managing a modular software application in accordance with Claim 16, said method further comprising sorting the listings in the first portion of the GUI window.

18. A method of managing a modular software application in accordance with Claim 16, said method further comprising displaying a detail view of the at least one child is listed in the second portion of the GUI window.

19. A method of protecting a modular software code segment comprising a plurality of rules for monitoring a specific asset, said method comprising:

creating at least one rule for a selected asset that relates at least one modular software code segment output to at least one modular software code segment input using at least one algorithm, the algorithm computed to at least one of detect and diagnose a predetermined problem to which the selected asset is susceptible;

encrypting the modular software code segment to facilitate preventing unauthorized viewing and editing the modular software code segment; and

transmitting the encrypted modular software code segment from a first computer to a second computer over a network.

20. A method of protecting a modular software code segment in accordance with Claim 19 wherein creating at least one rule for a selected asset comprises creating at least one rule for a selected asset in a software development tool executing on a computer.

21. A method of protecting a modular software code segment in accordance with Claim 19 wherein encrypting the modular code segment to facilitate preventing unauthorized viewing and editing comprises prompting a user for an encryption key that corresponds to the modular software code segment encryption.

22. A method of protecting a modular software code segment in accordance with Claim 19 further comprising encrypting the modular software code segment to facilitate preventing unauthorized application of the modular software code segment to an asset.

23. A network based monitoring and control system for a plant, said system comprising:

a client system comprising a user interface and a browser;

a centralized database for storing rule sets, the rule sets including at least one rule expressed as a relational expression of a real-time data output relative to a real-time data input, the relational expression being specific to a plant asset; and

a server system configured to be coupled to said client system and said database, said server system further configured to:

enable a user to import the at least one rule set into the server system, the rule set including full operand relative path information;

apply the imported rule set to a specific plant asset monitored by the plant monitoring and control system, the rule set configured to locate the data input using at least a portion of the full operand relative path information;

determine the data output of the imported rule set using the at least one relational expression and the data input; and

execute at least one of an event type and an actionable information text set.

24. A network based monitoring and control system in accordance with Claim 23 wherein said server system is configured to receive said rule set as an Extended Mark-up Language (XML) file.

25. A network based monitoring and control system in accordance with Claim 23 wherein said server system is configured to receive the rule set via at least one of an e-mail and a CD-ROM.

26. A network based monitoring and control system in accordance with Claim 23 wherein said server system is configured to import said rule set into a rule set library.

27. A network based monitoring and control system in accordance with Claim 23 wherein said plant monitoring and control system is one of a plurality of plant monitoring and control systems operated by a business enterprise wherein said server system is configured to:

enable a user to create a base rule set based on a specific plant asset type;

edit the base rule set to create a plant asset specific rule set; and  
transmit the rule set to the plant monitoring and control system.

28. A network based monitoring and control system in accordance with Claim 27 wherein said server system is configured to enable a user to test the plant asset specific rule set using at least one of plant asset design data, plant asset maintenance history, plant asset off-line analysis, and empirical testing.

29. A network based monitoring and control system in accordance with Claim 27 wherein said server system is configured to:

enable a user to select a condition to be detected, the condition being detectable using parameters monitored by the plant monitoring and control system;

create a relative path to the parameters;

select operands to process the parameters; and

create relative path to the output data.

30. A network based monitoring and control system in accordance with Claim 27 wherein said server system is configured to resolve the operands for at least one rule in the rule set.

31. A network based monitoring and control system in accordance with Claim 27 wherein said server system is configured to:

enable a user to create a conditionally executable at least one of an event type and an actionable information text set using the selected operands; and

append the created at least one of an event type and an actionable information text set to the rule set.

32. A network based monitoring and control system in accordance with Claim 23 wherein the plant monitoring and control system is one of a plurality of

plant monitoring and control systems operated by a business enterprise wherein said server system is configured to:

enable a user to select a rule set from at least one rule set applied to at least one of the plurality of plant monitoring and control systems; and

transmit the selected rule set from the at least one of the plurality of plant monitoring and control systems to the plant monitoring and control system.

33. A network based monitoring and control system in accordance with Claim 23 wherein said server system is configured to enable a business enterprise user to edit said rule set after said rule set is applied on the plant monitoring and control system.

34. A network based monitoring and control system in accordance with Claim 23 wherein said server system is configured to manage a modular software application including a plurality of software modules, each module has a user interface that includes a plurality of configurable parameters, the parameters selectable from at least one of a menu bar selection, a right-click menu selection, a property page selection, said server system is further configured to:

interface an object-oriented graphical user interface (GUI) window with the modular software environment wherein the GUI manages the plurality of software modules;

link the configurable parameters to the GUI window such that a hierarchical tree view of the configurable parameters is output; and

extend the GUI window using a plug-in facility in the GUI window such that additional software module configuration parameters are selectably managed by the application using a selectable user interface presentation.

35. A network based monitoring and control system in accordance with Claim 34 wherein the GUI window includes a hierarchical listing structure in a tree view wherein said server system is configured to:



list selectable software modules that include configurable parameters in a first portion of the GUI window; and

list configuration parameters of a software module when an associated software module is selected in a second portion of the GUI window.

36. A network based monitoring and control system in accordance with Claim 35 wherein said server system is further configured to:

list a selected configuration parameter in a first portion of the GUI window; and

list available sub-parameters for the selected configuration parameter in a second portion of the GUI window.

37. A network based monitoring and control system in accordance with Claim 35 wherein said server system is further configured to expand and collapse said listings in the first portion of the GUI window such that at least one child of the listed item is listed in the first portion subordinate to the listed item and such that said at least one child is listed in the second portion of the GUI window.

38. A network based monitoring and control system in accordance with Claim 37 wherein said server system is further configured to sort the listings in the first portion of the GUI window.

39. A network based monitoring and control system in accordance with Claim 37 wherein said server system is further configured to display a detail view of the at least one child is listed in the second portion of the GUI window.

40. A computer program embodied on a computer readable medium for managing a plant monitoring and control system using a server system coupled to a client system and a database, the client system including a user interface, said program comprising a code segment that prompts a user to select at least one rule set from a library of rule sets and then:

enables a user to import the selected at least one rule set into the server system, the rule set including full operand relative path information;

applies the imported rule set to a specific plant asset monitored by the monitoring and control system, the rule set configured to locate the data input using at least a portion of the full operand relative path information;

determines the data output of the imported rule set using the at least one relational expression and the data input; and

executes at least one of an event type and an actionable information text set.

41. A computer program in accordance with Claim 40 comprising a code segment that imports said rule set as an Extended Mark-up Language (XML) file.

42. A computer program in accordance with Claim 40 comprising a code segment that imports said rule set via at least one of an e-mail and a CD-ROM.

43. A computer program in accordance with Claim 40 comprising a code segment that imports said rule set into a rule set library.

44. A computer program in accordance with Claim 40 wherein said plant monitoring and control system is one of a plurality of plant monitoring and control systems operated by a business enterprise said computer program further comprising a code segment that:

enables a user to create a base rule set based on a specific plant asset type;

edits the base rule set to create a plant asset specific rule set; and

transmits the rule set to the plant monitoring and control system.

45. A computer program in accordance with Claim 44 comprising a code segment that enables a user to test the plant asset specific rule set using at least one of plant asset design data, plant asset maintenance history, plant asset off-line analysis, and empirical testing.

46. A computer program in accordance with Claim 44 comprising a code segment that:

enables a user to select a condition to be detected, the condition being detectable using parameters monitored by the plant monitoring and control system;

creates a relative path to the parameters;

selects operands to process the parameters; and

creates relative path to the output data.

47. A computer program in accordance with Claim 44 comprising a code segment that resolves the operands for at least one rule in the rule set.

48. A computer program in accordance with Claim 44 comprising a code segment that :

enables a user to create a conditionally executable at least one of an event type and an actionable information text set using the selected operands; and

appends the created at least one of an event type and an actionable information text set to the rule set.

49. A computer program in accordance with Claim 40 wherein the plant monitoring and control system is one of a plurality of plant monitoring and control systems operated by a business enterprise, the computer program further comprising a code segment that:

enables a user to select a rule set from at least one rule set applied to at least one of the plurality of plant monitoring and control systems; and

transmits the selected rule set from the at least one of the plurality of plant monitoring and control systems to the plant monitoring and control system.

50. A computer program in accordance with Claim 40 further comprising a code segment that enables a business enterprise user to edit said rule set after said rule set is applied on the plant monitoring and control system.

51. A computer program in accordance with Claim 40, wherein said server system is configured to manage a modular software application including a plurality of software modules, each module has a user interface that includes a plurality of configurable parameters, the parameters selectable from at least one of a menu bar selection, a right-click menu selection, a property page selection, said computer program further comprising a code segment that:

interfaces an object-oriented graphical user interface (GUI) window with the modular software environment wherein the GUI manages the plurality of software modules;

links the configurable parameters to the GUI window such that a hierarchical tree view of the configurable parameters is output; and

extends the GUI window using a plug-in facility in the GUI window such that additional software module configuration parameters are selectably managed by the application using a selectable user interface presentation.

52. A computer program in accordance with Claim 51 wherein the GUI window includes a hierarchical listing structure in a tree view, said computer program further comprising a code segment that:

lists selectable software modules that include configurable parameters in a first portion of the GUI window; and

lists configuration parameters of a software module when an associated software module is selected in a second portion of the GUI window.

53. A computer program in accordance with Claim 52 further comprising a code segment that:

lists a selected configuration parameter in a first portion of the GUI window; and

lists available sub-parameters for the selected configuration parameter in a second portion of the GUI window.

54. A computer program in accordance with Claim 52 further comprising a code segment that expands and collapses said listings in the first portion of the GUI window such that at least one child of the listed item is listed in the first portion subordinate to the listed item and such that said at least one child is listed in the second portion of the GUI window.

55. A computer program in accordance with Claim 54 further comprising a code segment that sorts the listings in the first portion of the GUI window.

56. A computer program in accordance with Claim 54 further comprising a code segment that displays a detail view of the at least one child is listed in the second portion of the GUI window.